

MATH 158 Assignment 1, Spring 2013

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Due Monday January 21st @ 4:20 pm.

Review of Differentiation

Differentiate the following functions of x .

- (a) $2 + x^{-3} + x^3$ (b) $x e^x$
(c) $\sqrt{1 - x^2}$ (d) $(1 - e^{-x})/(1 + x^2)$
(e) $\sin(2x + 3) - 2 \cos(3x)$ and (f) $\ln(2 - \cos x)$.

Section 8.1 Antiderivatives

Exercises 4, 16, 27, 28, 43, 44, 48, 62, 76, 77.

NB: skip integration rules 9–14. We won't use them.

Section 8.2 Integration by Substitution

Exercises 2, 13, 14, 21, 22, 28, 80.

For exercise 80, you should get $N(5) = 6,857.9$. Show your working.

NB: the answer given in the book for exercise 13 is incorrect.

NB: skip integration rules 15–18 as we will not use those either.

Section 8.3 Area and the Definite Integral

Exercise 10. Calculate also $\int_0^1 x^3 dx$ to determine the exact area.

Section 8.4 The Fundamental Theorem of Calculus

Exercises 7, 8, 14, 22, 34, 36.

Section 8.5 Evaluating Definite Integrals

Exercises 1, 2, 61, 62, 68, 71, 78.

For exercise 78, letting $P(t)$ denote the total world production of coal in tons at time t years, we are being told that the production rate $P'(t)$ at time t is $3.5e^{0.05t}$ tons/year. It's the same as being told a velocity and being asked to find the distance travelled between 1980 and 2000. You should get 120.28 tons.